CLAIMS

What is claimed is:

1. A fingerprint imager for capturing an image of fingerprint comprising:
a single sensor integrated circuit having
a) an imaging array having a plurality of sensors arranged along a first axis for capturing a sub-image of the fingerprint at one time; wherein the fingerprint is moved with respect to the imaging array in a direction that is generally perpendicular to the first axis; and
b) a mechanism for determining a change in the position of the fingerprint with respect to time.

2. The fingerprint imager of claim 1 wherein the mechanism for determining a change in the position of the fingerprint with respect to time includes
b1) a navigation array having a plurality of sensors for capturing navigation images of a portion of the fingerprint as the fingerprint moves with respect to the navigation array; and
b2) a navigation circuit, coupled to the navigation array, for controlling when the navigation array captures navigation images and for receiving the navigation images and based thereon for determining the amount of movement of a fingerprint generally along the first axis and the amount of movement of a fingerprint along a second axis that is generally perpendicular to the first axis.

3. The fingerprint imager of Claim 1 wherein the imaging array and the navigation array share at least one sensor.

4. The fingerprint imager of Claim 1 wherein the imaging array is separate from the navigation array.

5. The fingerprint imager of Claim 1 wherein the plurality of sensors is one of resistive-type sensors, capacitive type sensors, and optical-type sensors.

6. The fingerprint imager of Claim 1 wherein the fingerprint imager includes a surface along which a finger is moved and wherein the fingerprint imager is implemented in a stand-alone unit comprising:
a) optics for focusing light onto the surface; and
b) optics assembly for housing the optics.

7. The fingerprint imager of Claim 1 wherein the fingerprint imager includes a surface along which a finger is moved and wherein the fingerprint imager is implemented in a personal computer (PC) peripheral comprising:
a) optics for focusing light onto the surface; and
b) optics assembly for housing the optics.

8. The fingerprint imager of Claim 7 wherein the PC peripheral device is one of a cursor pointing device and a keyboard.

9. The fingerprint imager of Claim 1 wherein the fingerprint imager includes a surface along which a finger is moved and wherein the surface is one of a physical surface and an optical imaging plane.

10. The fingerprint imager of Claim 1 wherein the pixel size of the sensors of the ISA is different from the pixel size of the sensors in the NSA.

11. The fingerprint imager of Claim 10 wherein the pixel size of the sensors of the ISA has the dimensions of about 50 microns by about 50 microns and the pixel size of the sensors of the NSA has the dimensions of about 20 microns by about 20 microns.

12. The fingerprint imager of Claim 1 wherein the resolution of the sensors of the ISA and the sensors of the NSA is about 500 dots per inch.

13. The fingerprint imager of Claim 1 wherein the fingerprint imager is implemented in a stand-alone unit and wherein the fingerprint imager further comprises:
a) a capacitive sensor having a surface along which a finger is moved; and
b) an assembly for housing the capacitive sensor.

14. The fingerprint imager of Claim 1 wherein the fingerprint imager is implemented in a personal computer (PC) peripheral and wherein the fingerprint imager further comprises:
a) a capacitive sensor having a surface along which a finger is moved; and
b) an assembly for housing the capacitive sensor.

15. The fingerprint imager of Claim 1 further comprising:
a) an imaging array strobe generator for employing the change in position to selectively control when the imaging array captures the sub-images; and
b) a processor;
c) a composite image generation software which when executing on the processor receives the sub-images and the movement information for each sub-image relative to a previous sub-image and based thereon generates a composite image of the fingerprint; and
d) an identification software which when executing on the processor receives the composite image of the fingerprint, analyzes the composite image to generate minutia, and compares the generated minutia to previously stored minutia, and grants access to a resource if the generated minutia matches one of the previously stored minutia.

16. The fingerprint imager of Claim 1 further comprising:

a) a processor; and

b) a cursor control software which when executing on the processor receives the movement information from the navigation engine and uses the movement information to control the cursor.

17. The fingerprint imager of Claim 1 wherein the imaging array is a 1 by N sensor array.

18. The fingerprint imager of Claim 2 wherein the navigation array is a P by Q sensor array.

19. An imager for capturing an object to image comprising:

a) a surface having an axis; wherein the object is moved in a first direction relative to the axis of the surface;

b) an imaging sensor array having a plurality of sensors arranged along a first axis for imaging a portion of the fingerprint at one time in response to an asserted imaging sensor array strobe signal;

b) a navigation sensor array having a plurality of sensors for obtaining movement information of the object in response to an asserted navigation sensor array strobe signal; and

c) a navigation circuit, coupled to the navigation array, for receiving images and based thereon for determining the amount of movement of a finger in a first direction and in a second direction;

wherein the imaging sensor array, navigation sensor array and the navigation circuit are integrated in a single chip.

20. A method of imaging an object by using a single sensor chip having an integrated navigation engine comprising:

a) capturing movement information of an object by using a navigation sensor array and the navigation engine;

b) based on the movement information, determining when to capture a sub-image of the object by using an imaging sensor array having a plurality of pixels for imaging a portion of the object at one time;

c) successively capturing a plurality of sub-images by using an imaging sensor array as the object moves with respect to the imaging sensor array; and

d) generating a composite image of the object based on the captured portions of the object by using a processor-based application;

wherein the single sensor chip is integrated with the navigation engine and navigation sensor array.